

The Fire Research Development and Application Committee (FRDAC)

An AWFCG Sponsored Committee

<https://www.frames.gov/partner-sites/afsc/partner-groups/frdac/>

The purpose of the FRDAC is to:

- 1) identify and prioritize ***fire research needs*** in Alaska, and
- 2) facilitate the development and exchange of fire effects, ***fire behavior, fire danger and weather information.***



The Purpose of the Alaska Fire Research Needs List

- identify and prioritize current data management needs
- promote awareness
- encourage researchers to develop projects that address them

2014 Fire Research Needs List

Click on each General Topic to see the *full description*, a list of *research questions/needs*, and *related research* (in development). Use the search box on the right to search for terms or phrases within the table below.

<i>Priority</i> ▲	<i>Category</i>	<i>General Topic</i>	<i>Group ID</i>
01	Fire Behavior	Fire Behavior Models: Validation and Application [LINK]	2010-29
02	Fire Danger	CFFDRS Fire Weather Indices: Evaluation and Calibration [LINK]	2010-04
03	Climate Change	Climate Impacts on Fire Regimes: Past, Present and Future [LINK]	2010-16
04	Fuels Treatment	Fuels Treatments: Short- and Long-Term Effectiveness [LINK]	2010-18
05	Fire Effects	Human Subsistence Lifestyles [LINK]	2010-09

Online descriptions of CFFDRS-Related Research Needs

Priority 1 – Fire Behavior Models, Validation and Application

Description:

Research is needed to improve the knowledge of fire behavior and appropriate fuel models for Alaska. More information on the [40 Fuel Models](#) and the [Canadian Forest Fire Behavior Prediction \(FBP\) Fuel Models](#) is needed on a spatial scale for use in fire behavior modeling. Fire modeling tools are currently utilized by Alaska fire managers (e.g. Fire Spread Probability [FSPro] in the [Wildland Fire Decision Support System](#) [WFDSS]). However the confidence level of model outputs from the tools is unknown. Efforts have been made to relate [LANDFIRE](#) ecotypes to [Alaskan Fuel Models](#). However, questions remain about the accuracy of the LANDFIRE vegetation classifications and crosswalks between LANDFIRE and Alaskan fuel types.

There is a need for research that will improve the knowledge of fire behavior and appropriate fuel models for several unique fuel types; wetlands, shrublands, and tundra ecosystems as well as in forested ecosystems with insect and disease damage. Additionally, fuel models and fire behavior in early successional post-fire forest types are also of particular interest since shortened fire return intervals are occurring and recent burned areas are no longer acting as fuel breaks.

Research Questions/Needs:

- Fire behavior validation of the 40 Fuel Models and Canadian Fuel Models used in Alaska.
- Are fire behavior modeling tools accurately reflecting drought conditions? How well do the models correlate with CFFDRS indices, fuel moisture, and observed fire behavior?
- Landscape-level landcover classifications and fuels maps need to be updated to incorporate succession within recent burns before modeling application.
- How accurate are the LANDFIRE vegetation classifications? How accurate are the crosswalks between LANDFIRE and Alaskan fuel types?
- Which fuel models should be used for non-forested tundra ecosystems, early successional post-fire forests and forested ecosystems with insect and disease damage? Validate fuel models against actual fire behavior.
- What climatic, weather and fuels conditions allow fires to burn into recently burned areas?

Priority 2 – CFFDRS Fire Weather Indices, Evaluation and Calibration

Description:

In Alaska, fire planners, fire managers, and firefighters heavily utilize the [CFFDRS indices](#) for prescribed burn planning, daily resource availability and allocation, operational strategies and suppression tactics. The CFFDRS Fire Weather Indices are based on empirical data from eastern red and jack pine stands. Further empirical studies are needed to determine if Alaskan fuels should have modified algorithms to better relate observed data to the CFFDRS indices.

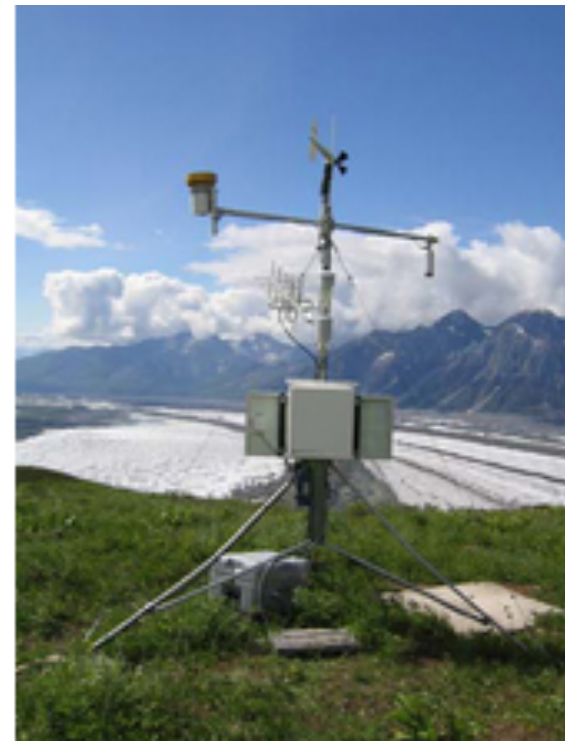
Specifically, there is a strong need for calibration of the CFFDRS indices for Alaskan boreal fuel types to ensure accurate representation of seasonal changes in duff moisture. Also needed is a mechanism for standardization of spring start-up values for the CFFDRS indices to adequately reflect the effects of over-winter drought conditions, snowmelt date, and soil thaw on fire danger.

Research Questions/Needs:

- Evaluate CFFDRS fire weather indices and drying trends throughout Alaska. Are there variations across regions?
- Evaluate relationships between CFFDRS indices and: 1) probability of ignition, 2) rate of spread, 3) fire duration and 4) depth of organic fuel consumption.
- Are indices calculated from remote automated weather stations (RAWS) accurately representing duff moisture? Do they adequately reflect the effects of over-winter drought conditions, snowmelt date, and soil thaw?
- Should over-winter drying values or default startup values be utilized for drought codes, particularly in relation to the occurrence of fires that overwinter? Can these codes be tied to early season fire danger predictions?
- How does soil moisture fluctuate throughout spring melts and summer drying? How accurately are these fluctuations represented by the moisture codes?

CFFDRS Ranking in Fire Research Needs Lists:

- 2003 - CFFDRS number 1
- 2005 - CFFDRS number 2
- 2008 - CFFDRS ranked High
- 2011 - CFFDRS ranked number 2
- 2014- CFFDRS ranked number 2




* different ranking system

Online:



The purpose of developing the Fire Research Topic List is to encourage fire research and funding proposals that address fire and land management needs in Alaska.





Alaska Wildfire Research Needs: Connecting Scientists and Managers

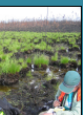
Alaska Wildland Fire Coordinating Group - Fire Research, Development & Application Committee

Why Do We Need An Alaska Fire Science Research Needs List?

Fire is the most prevalent natural disturbance in Alaska, affecting vast swatches of forest and tundra. Management of fire resources requires understanding a large portion of the state. Many Alaskans continue to be effectively isolated from communities undisturbed and often the power grids.

Alaskan land and fire managers need science-based information to make ecologically sound and effective decisions about fire management activities, including the suppression. The Fire Research, Development & Application Committee (FRDAC), sponsored by the Emergency Alaska Wildland Fire Coordinating Group (EAWFCG), is charged to investigate, identify and prioritize the research needs for directly address the fire and management questions in Alaska.

The result is a prioritized set of research topics that was initiated in 2002 and is released at 2-3 year intervals. The purpose of the list is to encourage fire research and funding for projects that address the management needs in Alaska. The FRDAC also strives to promote awareness of these research questions within the research community.



Development of the Research Needs List: A Collaborative Effort

Five research ideas for the current list were solicited from a broad range of agency fire, biological, and land management staff and attendees at the 2003 Annual Meeting in Fairbanks, Alaska. Research questions were combined into 27 general topics that fell into 6 categories that included subjects such as the behavior models and fire effects. Topics were then refined based on consensus to the management needs to create the final list.

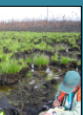
The FRDAC works closely with the Alaska Fire Science Consortium to advertise the research needs list, get potential researchers in contact with the managers, and facilitate opportunities for completed and ongoing projects.

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2011-2013 Prioritized Alaska Wildfire Research Needs

Rank	Category	General Topic	Rank	Category	General Topic
1	Fire Behavior Models	Fire Behavior Mechanisms, Initiation and Application	14	Weather	Fire Season Weather Forecasts
2	Fire Effects	CFFIRE or the Weather Index: Evaluation & Calibration	15	Tactics	Current Fire Management Options
3	Climate Change	Climate Impacts on the Rangeland, Forest, & Urban	16	Social, Stakeholder, & Information	Fire Outreach & Public Awareness Objectives
4	Fuels Treatment	Fuels Treatments Short- & Long-term Effectiveness	17	Fire Effects	Risk Analysis & Population
5	Fire Effects	Post-Fire Vegetation Succession Pathways	18	Smoke & Carbon Emissions	Smoke Models & Human Impacts
6	Fire Effects	Invasive Plant Species	19	Tactics	Fire Suppression Methods Effectiveness
7	Weather	Fire Weather Forecasting	20	Fire Effects	Burn Intensity & Population
8	Climate Change	Climate Change Impacts on Fire Effects	21	Fire Effects	Unburned Habitat & Population
9	Fire Effects	Burn Severity: Detection & Trends	22	Smoke & Carbon Emissions	Carbon Sequestration
10	Fire Effects	Hydrology, Wetlands & Ecosystem Function	23	Fire Effects	Follow-up & Small Mammal Habitat Populations
11	Fire Effects	Human Subsistence Outlets	24	Fuels	Degradation Status of Woody Substr
12	Fuels Treatment	Utilization of Fuels Treatment Regimens	25	Fire Effects	Wild Fire Productivity & Variability
13	Tactics	Fire Evacuation/Ethics/Overviews			

Example of Specific Research Questions

Topic: Fire Behavior Models, Validation and Applications (Priority #1)

Description:
Research needed to improve the knowledge of the behavior and appropriate fuel models for Alaska. Work information on the Scott and Steyer model for the Canadian Forest Fire Behavior Prediction System. Fire modeling can be applied scale for use in fire management planning. Fire modeling can be currently utilized in the Wildland Fire Decision Support System. However, the current models are limited in their ability to predict fire behavior under conditions of extreme weather. This work has been made to make a detailed approach to develop fuel models, which would include the accuracy of the LANDFIRE vegetation classification and comparable between LANDFIRE and Alaska Fuel Types.

Research Questions/Tasks:
• Fire behavior validation of the K-10 Fuel Model and Canadian Fuel Models used in Alaska.
• In the modeling tools accuracy reflect drought conditions as well as the model compare with CFFIRE index. But, notations, and observed the behavior.
• Land-use/cover indicator classifications and fuels map need to be made available for the use of the LANDFIRE vegetation classification and comparable between LANDFIRE and Alaska Fuel Types.
• What fuel models should be used for non-forested lands ecosystems, with non-wooded plant species and forested ecosystems with tree or shrub storage? Validated fuel models against the behavior.
• What distance, weather, and fuels condition used to burn site recently burned?

How Can the FRDAC Help Researchers?

Doing may particularly become outside through FRDAC or directly from individual agencies.









The FRDAC will selectively send letters of request for research grants to you and the proposals address the following ranking criteria:

- Was the proposal meet FRDAC research needs?
- Will the research benefit multiple agencies?
- Does the proposal have clear management application?
- Is the proposal prepared for technological transfer?

The FRDAC can provide collaboration on the data needs for Alaska and the National information for the fire community for activities as follows:

For additional information: <http://www.frames.gov/alasca/frdac/>
Or contact current chair: Lisa Saperstein, lisa_saperstein@usgs.gov

The Fire Research Development and Application Committee is comprised by one member from the following agencies:

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Promoting the Research Needs – FRDAC Letters of Support for JFSP Funding

Letters of Support

Funding Opportunities

2015 JFSP Funding Opportunity Notices

The FRDAC encourages researchers to consider projects that address topics on the research needs list. Although no funding is allocated specifically for projects, researchers are encouraged to submit proposals to various funding sources (e.g., [Joint Fire Science Program](#), [National Science Foundation](#), etc). Funds may periodically become available through the [Alaska Wildland Fire Coordinating Group](#) (AWFCG) or directly through individual agencies.

AWFCG will selectively send letters of support for research based on how well they meet the following criteria:

1. Does the proposal meet the established AWFCG [research needs](#)?
2. Will it benefit multiple agencies?
3. Does the proposal have direct management application?
4. Does the proposal provide for appropriate technological transfer?

Contact the [FRDAC Chair](#) to request a letter of support.

Submitting a proposal to the Joint Fire Science Program? All requests for AWFCG letters of support must be submitted to FRDAC by:

November 7, 2014

FRDAC encourages you to submit your request earlier if possible.